

## **DIRECT DRIVE HOSE REEL ASSEMBLY**

### **Area of the Invention**

5 This invention relates to the area of reels for storing tubing and in particular to hose reels for all hose applications. The present invention relates to a hose reel assembly having an integrated automotive hub and bearing assembly and frame such that a unitary system is provided.

### **Background to the Invention**

10 Traditional mechanical hose reels, even for industrial applications, provided direct hand cranked systems with bearings to assist in the rewind. These systems provided spools for housing the hose mounted on a frame supported between two axial bearing assemblies with a crank means located at one end.

To assist in the rewind process this type of hose reel came to be provided with  
15 either electric motors or compressed air or hydraulic motors. Such systems might be geared or not but all feature a spool type housing of some type mounted inside a support frame which is adapted to both support and drive a specific spool. The drive mechanisms of such reels have conventionally

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included chain and sprocket type drives and the like and their inherent safety problems.

### **Outline of the Invention**

It is an object of this invention to provide an improved hose reel which avoids  
5 the limitations that conventional hose reel designs have. In particular it is an  
object of the invention to provide an improved direct drive to a reel.

The invention is a hose reel assembly having a unitary support member  
associated with a hose reel spool having a riser connected therethrough to  
provide a fluid path, which support member includes an axle, bearing and hub  
10 assembly, the arrangement being such that an integrated frame, bearing  
assembly, gearbox and drive unit housing is provided.

It is preferred that the hub be of an automotive type.

It is preferred that a 5 stud hub construction be used such that assembly and  
disassembly of the reel is effected in a similar manner to a wheel change on  
15 a vehicle although any multiple stud hub may be used.

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It is further preferred that a rewind speed controller and torque multiplier which houses a gear reduction set is thereby located within the spool of the hose reel assembly.

It is also preferred that the gear box be a drum type gearbox and that the hub  
5 is part of the gearbox assembly. It is further preferred that the interior of the hub be adapted to receive a ring gear to engage with other gears in a drive train.

It is also preferred that the riser have fluid pathway components into and out of the spool which components can be readily attached and detached from the  
10 spool without first removing it from the hub.

It is further preferred that the spool have an interior surface about which a hose can be wound said interior surface tapering towards the centre of the spool to facilitate both hose winding and stacking of spool components when required.

15 In order that the invention may be more readily understood we will describe by way of non-limiting example a specific embodiment thereof.

**Brief Description of the Drawing Figures**

Fig. 1 Shows a side view of the hose reel assembly of the invention;

Fig. 2 Shows a schematic cross-section through the hose reel assembly;

5 Fig. 3 Shows a perspective view of the hose reel assembly;

Fig. 4 Shows details of the riser components;

**Description of an Embodiment of the Invention**

In one embodiment of the invention a hose reel assembly 10 as shown in Figure 2 is provided in which the reel spool 20 is supported on a mounting  
10 frame 30 or support associated with a single automotive style stub axle, bearing and five stud hub assembly. By this means simplicity of servicing is provided and assembly and disassembly of the reel is accomplished in a similar manner to changing a vehicle wheel.

In addition the factory assembly of this reel assembly is time effective due to  
15 the use of the 5 stud hub construction. Many previous reels have used two bearing blocks on each side of the hub shaft that require general axial alignment and add to the width of the assembly. The design of the present invention eliminates this requirement.

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Additionally other reels rely on the bearing assembly within the drive unit to support the spool whereas the hub loads in the reel system of the invention are taken up by the support and are not transmitted to the bearings of the drive unit thereby increasing the life of the gear box bearings and components.

5 The mounting system of the invention is a fully integrated frame 30, bearing assembly and gearbox 50 and drive unit 40 housing all in a single assembly. This allows for an extremely compact strong unit which keeps overall width to a minimum. This is clearly superior to previous hose reel assemblies which rely on plate bracket type systems to support hub bearings thereby requiring  
10 a larger overall width for a smaller spool width.

The hose reel system of the invention is also provided with a uniquely shaped rewind speed controller and torque multiplier which houses a gear reduction set 50 that, due to its drum shape, allows it to be located within the spool of the reel assembly . This also keeps width to a minimum.

15 This gearbox housing is cylindrically shaped in accordance with the shape of the spool diameter and is designed to allow retro fit of various drive mechanisms 40. These can include air, hydraulic electric and spring drive means. In this embodiment of the invention the gear box is a drum type gearbox and the hub 60 is part of the gearbox assembly. The arrangement is

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that the interior of the hub is adapted to receive a ring gear to engage with other gears in the drive train.

Another feature of the invention is that it includes a reduction box having torque multiplying characteristics that permits the use of smaller style spring  
5 cartridges with a greater number of turns and reduced torque allowing cheaper smaller springs to be used.

Another benefit of the hose reel system of the invention is that because the spool is hub mounted access is provided at one side to the fluid path and riser unlike previous reels which require significant disassembly to remove the fluid  
10 path. As a result any riser and fluid path may be attached to the reel of the invention.

As can be seen from Figures 1 and 4 the spool 20 has associated with it a quick change riser 70 assembly consisting of components 71 and 72 which are connected together through base plates 73 and 74 with component 71 being  
15 attached to face 25 of the spool by means of plate 75.

As these components can be readily detached it is a feature of the invention that a wide range of different sized risers can be attached or removed in this manner without the necessity of detaching the hose reel spool from the frame and hub assembly.

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Another feature of the invention is that spools may be provided in modular designs which allow easy width changes by the simple addition of extension axle components and drum extensions on standard reels which components may simply be bolted on.

- 5 A further feature is that the hose reel spool 20 consists of two halves or components 24 having surfaces 21 which taper down in diameter towards the middle 22 of the spool which permits the hose to wind neatly onto the spool.

This taper also allows for more efficient stacking of the spool components 24 inside each other for transport when the spool arrangement is dismounted  
10 from the frame/hub assembly.

It is further envisaged that the drive gear could be able to disengage from the driven gear to permit a spool to freewheel when hose was being withdrawn from it. This is effected by the drive motor plate having a pivot option along the mounting face plane and being allowed to slide up slightly and disengage the  
15 drive gear.

This action could be sprung and be normally disengaged so that the air or hydraulic drive could initiate an actuator rod which would engage the motor drive gear when motive force was required.

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Many variations as described can be made within the framework of the invention and it is not restricted as to size of and type of components. The invention lies in the provision of a hose reel assembly having an automobile type hub mounting such that an integrated frame, bearing assembly and  
5 gearbox drive unit housing is provided.

While we have described herein one specific embodiment of the invention it is envisaged that other embodiments of the invention will exhibit any number of and any combination of the features of those previously described and it is to be understood that variations and modifications in this can be made without  
10 departing from the spirit and scope of the invention.